

REMARKS

This paper is submitted in reply to the Office Action dated July 21, 2004, within the three-month period for response. Reconsideration and allowance of all pending claims are respectfully requested.

In the subject Office Action, claims 1-4, 6-7, 12- 15, 17-22, 24, 29-30, and 32-38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,828,836 to Westwick et al. in view of U.S. Patent No. 5,590,277 to Fuchs et al., and claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable Westwick et al. in view of Fuchs et al. and U.S. Patent No. 5,748,882 to Huang. The Examiner, did indicate, however, that claims 5, 8-11, 14, 16, 23, 25-28, and 31 were directed to patentable subject matter.

Applicants respectfully traverse the Examiner's rejections to the extent that they are maintained. Applicants have canceled claim 18 without prejudice, amended claims 1, 17, 19-20, 24, 34 and 36, and added new claim 39. Applicants respectfully submit that no new matter is being added by the above amendments, as the amendments are fully supported in the specification, drawings and claims as originally filed.

Now turning to the subject Office Action, and more specifically to the rejection of independent claim 1, this claim generally recites a method of restarting a node in a clustered computer system, wherein the clustered computer system hosts a group that includes first and second members that reside respectively on first and second nodes. The method includes notifying the second member of the group using the first member in response to a clustering failure on the first node, and initiating a restart of the first node using the second member in response to the notification.

In addition, the Examiner will note that Applicants have amended claim 1 to clarify that the notification of the second member using the first member is made by issuing a request to the group to which the first and second members belong.

It is important to note that claim 1 is directed to a method of restarting a node in a clustered computer system, specifically via the interaction of members of a group hosted by the clustered computer system. As noted, for example, on pages 1-2 of the Application, the concepts of "groups" and "members" are important characteristics of clustered computer systems. Groups are logical entities in a cluster that are used, for example, to enable different nodes in a cluster to cooperate with one another to handle a computer task. Groups includes member jobs resident on different nodes of a clustered computer system, and the member jobs are allowed to communicate with one another by sending requests to the group, whereby the clustering infrastructure delivers the requests to every other member of the group.

Westwick, on the other hand, is directed to a networked system where a plurality of controllers 14A-14N are coupled to a host processor 12 in a master-slave arrangement, with control over the configuration of the system maintained by host processor 12. Of note, however, Westwick is not a directed to a clustered computer system, and incorporates no functionality that is analogous to groups or group members resident on different nodes of a clustered computer system. Indeed, given the different functionality of a host processor and the controllers, Applicants submit that one of ordinary skill in the art would not consider a host processor and a controller to correspond to different nodes of a clustered computer system.

What Westwick does disclose is support for a controller to send an "alert" message to the host processor to signal a fault in the controller (col. 6, lines 43-51), and for a host processor to send a "restart controller" message to restart a controller (col. 6, lines 60-65). Of note, however, a controller and a host processor in the Westwick environment are not members of a group in a clustered computer system. As such, neither an "alert" message, nor a "restart controller" message corresponds to a request issued to a group. Indeed, given the lack of disclosure directed to clustering and groups,

Applicants submit that there is no analogous concept in Westwick to sending any sort of request "to a group" or similar logical entity.

Therefore, Applicants respectfully submit that Westwick fails to disclose the claimed feature of notifying a second member of a group of a failure in a first node by using a first member that is resident on the first node to issue a request to the group.

Fuchs, likewise, does not remedy this shortcoming in Westwick. Beyond the fact that Fuchs fails to disclose one node of a multi-node system notifying another node of its own failure, Fuchs does not even disclose the concept of a group or similar logical entity, nor the concept of one member of a group being capable of issuing a request "to the group", as required by claim 1.

As Fuchs fails to remedy these shortcomings of Westwick, Applicants respectfully submit that the reference cannot be relied upon to suggest modifying Westwick to utilize groups, members or requests directed by particular members of a group to the group itself, as would be required to establish a *prima facie* case of obviousness.

Furthermore, as neither Westwick nor Fuchs discloses the concept of notifying one node of the failure of another node by using a member resident on the failing node to issue a request to a group that notifies a member resident on the non-failing node, Applicants respectfully submit that the combination proposed by the Examiner falls short of teaching each and every feature of claim 1.

In the Examiner's remarks with respect to claim 1, and with respect to other claims that address the issues of groups, members and group requests, it is apparent that the Examiner has taken an excessively broad reading of groups, members and group requests. In particular, it appears that the Examiner considers that any collection of components in a distributed computing system is capable of functioning as a group, and that any component in such a collection is capable of corresponding to a member of a group. Furthermore, it appears that the Examiner considers any communication from one component to another is capable of corresponding to a request to a group.

By taking such a broad interpretation of these concepts, however, the Examiner is effectively reading out of the claim the clustering-specific nature of Applicants' invention. It is important to note that Applicants are not attempting to obtain protection for each and every mechanism for notifying one component in a distributed computer system of the failure of another component. Claim 1, in particular, recites a specific mechanism whereby one member of a group in a clustered computer system issues a request directed to a group to notify another member of the group of a failure in a particular node in a clustered computer system. This specific mechanism is neither disclosed nor suggested by any of the prior art of record, and as a result, claim 1 is non-obvious over the prior art of record. Reconsideration and allowance of claim 1, and of claims 2-4 and 6-13 which depend therefrom, are therefore respectfully requested.

Next with respect to the rejection of independent claim 15, this claim generally recites a method of restarting a node among a plurality of nodes in a clustered computer system, where the clustered computer system hosts a cluster control group that includes a plurality of cluster control members, each residing respectively on a different node from the plurality of nodes. The method includes detecting a clustering failure on a first node among the plurality of nodes, in response to detecting the clustering failure on the first node, issuing a membership change request from the first node to the cluster control member on each other node in the plurality of nodes, the membership change request indicating that the membership change request is for the purpose of restarting the first node, terminating clustering on the first node after issuing the membership change request, in response to the membership change request, selecting a second node from the plurality of nodes that is different from the first node, issuing a start node request using the selected second node, the start node request indicating that the purpose of the start node request is for restarting the first node, and in response to the start node request, initiating clustering on the first node.

In rejecting the claim, the Examiner relies upon the reasons set forth in the Office Action for rejecting claims 1-4 and 6-7. Of note, however, the Examiner's comments with respect to each of these rejections disregard the fundamental claimed concepts related to clustering, namely the concepts of a cluster control group and the issuance of a membership change request that indicates that the request is for the purpose of restarting a node. In particular, the Examiner relies on col. 7, lines 1-11 of Westwick for allegedly disclosing the issuance of a membership change request that indicates the request is for the purpose of restarting a node. Westwick, however, is completely silent with respect to clustering, and as such, the concept of changing membership for a group is entirely foreign to the Westwick system. The cited passage in col. 7, moreover, discusses only the concept of stopping a controller, and is completely silent with respect to any "membership" of a controller in a logical entity such as a group.

Fuchs does not remedy this shortcoming of Westwick. The Examiner does not assert, nor could the Examiner assert, that Fuchs discloses the initiation of a node restart via a membership change request that indicates the request is for the purpose of restarting a node. As such, the combination of Westwick and Fuchs falls short of establishing a *prima facie* case of obviousness as to claim 15.

It appears the Examiner is attempting to analogize a "membership change request" to any data communication that results in a notification of a failure in a distributed computing system. By doing so, however, the Examiner is reading out of the claim the concept of membership change, as well as the concept of a request that may be issued in a cluster to effectuate such a change in membership. To establish a *prima facie* case of obviousness, it is necessary that the prior art disclose or suggest each and every feature of a claim. As claim 15 recites a specific manner in which a failure notification is implemented (through the use of a membership change request that indicates that the purpose of the request is to restart a node), the Examiner is required to establish that this concept is disclosed or suggested by the prior art of record. The Examiner has not met

this burden, and as a result, Applicants respectfully submit that the rejection should be withdrawn. Reconsideration and allowance of claim 15 are therefore respectfully requested.

Next with respect to independent claim 17, this claim generally recites an apparatus that includes a memory accessible by a node in a clustered computer system, and a program resident in the memory, the program configured to initiate a restart of another node in the clustered computer system in response to a notification from the other node of a clustering failure on the other node. The claim has been amended herein to clarify that the program comprises a member of a group hosted by the clustered computer system and including an additional member residing on the other node, and that the notification comprises a request issued to the group by the additional member.¹

As discussed above in connection with claim 1, the combination of Westwick and Fuchs fails to disclose or suggest the initiation of a node restart in response to a notification from the node to be restarted, where the notification takes a form of a request issued to a group by a member on the node to be restarted. Therefore, Applicants submit claim 17 is non-obvious over Westwick and Fuchs for the same reasons as set forth above in connection with claim 1. Reconsideration and allowance of claim 17, as well as of claims 19-22 which depend therefrom, are therefore respectfully requested.

Next with respect to independent claims 24, 34 and 36, each of these claims has been amended to clarify that the notification that initiates a restart of a node in a clustered computer system is made via a member of a group issuing a request to the group. As discussed above in connection with claim 1, the combination of Westwick and Fuchs fails to disclose or suggest the initiation of a node restart in response to a notification from the node to be restarted, where the notification takes a form of a request issued to a group by a member on the node to be restarted. Therefore, Applicants submit claims 24, 34 and 36

¹Claim 18 has been canceled, and claims have been 19-20 amended, for consistency with the amendments to claim 17.

are non-obvious over Westwick and Fuchs for the same reasons as set forth above in connection with claim 1. Reconsideration and allowance of claim these claims, as well as of claims 26-333, 35 and 37-38 which depend therefrom, are therefore respectfully requested.

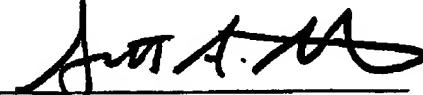
As a final matter, with respect to the various dependent claims, Applicants traverse the rejections principally based upon the dependency of these claims on the aforementioned independent claims. However, Applicants also note that a number of the dependent claims recite a number of clustering-related concepts that are not disclosed or suggested by the prior art of record. In the interests of prosecutorial economy, these claims will not be discussed separately herein.

Moreover, the Examiner will note that Applicants have added new claim 39, which depends from claim 1, and additionally recites that the claimed group further includes a third member that resides on a third node in the clustered computer system, and that issuing the request to the group includes forwarding the request to each of the second and third members of the group. The claim also adds the step of selecting the second member to initiate the restart of the first node. It should be noted that in Westwick any alert messages are sent directly from a controller to the host processor, and there is no selection of the host processor from among other alternatives to initiate a restart of a controller. As such, Applicants submit claim 39 is additionally patentable for this reason.

In summary, Applicants respectfully submit that all pending claims are novel and non-obvious over the prior art of record. Reconsideration and allowance of all pending claims are therefore respectfully requested. If the Examiner has any questions regarding the foregoing, or which might otherwise further this case onto allowance, the Examiner may contact the undersigned at (513) 241-2324. Moreover, if any other charges or credits

are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,



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Date

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